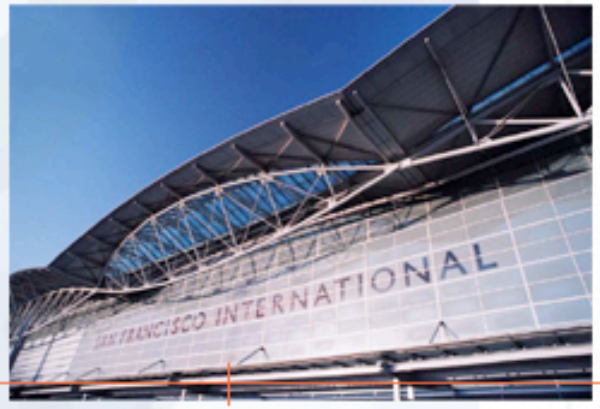


San Francisco International Airport

Capacity Management and Delay Reduction

PRM/SOIA

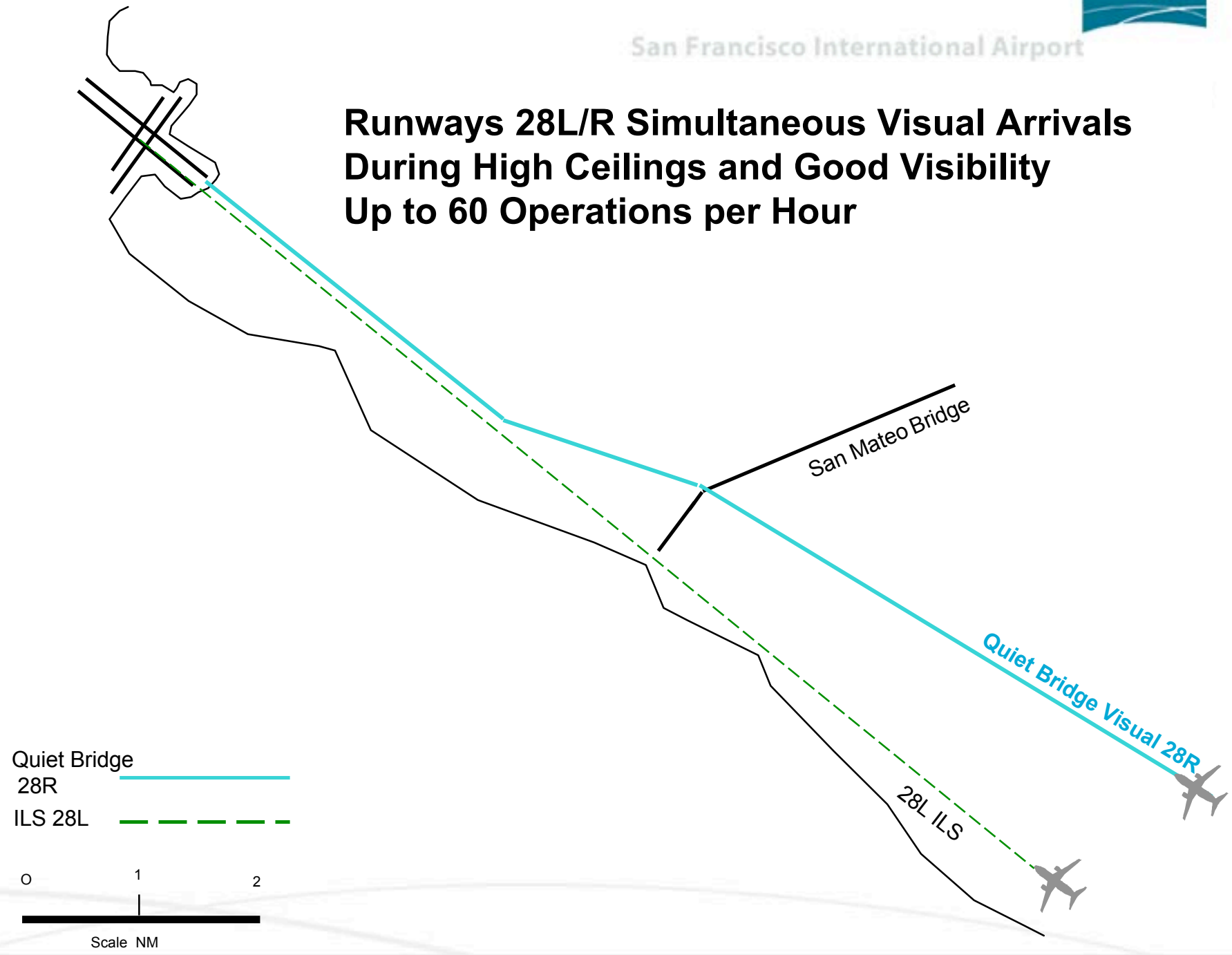
FAA/NASA/Industry

Airport Planning Workshop

September 12, 2006

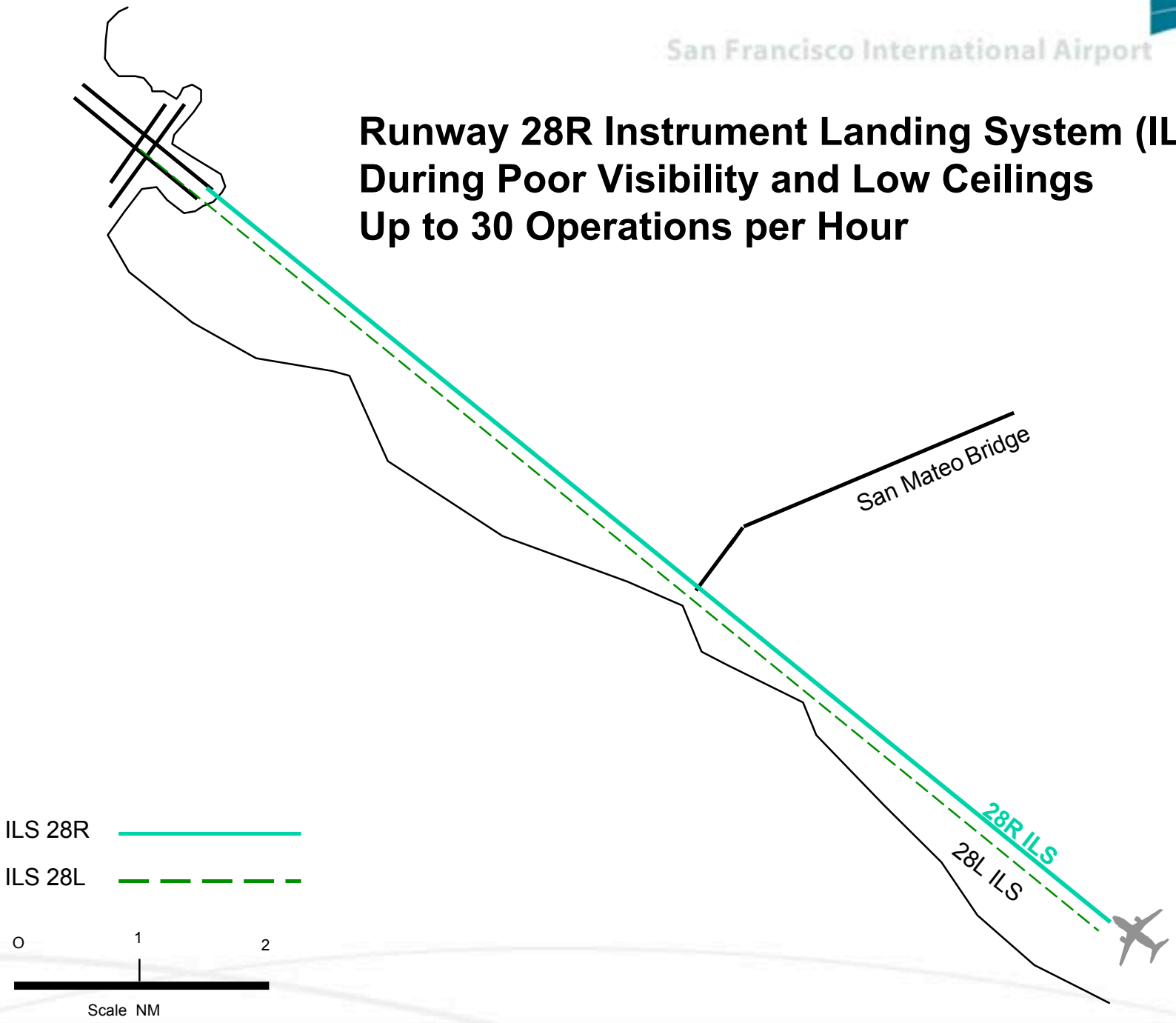
San Francisco International Airport

Runways 28L/R Simultaneous Visual Arrivals During High Ceilings and Good Visibility Up to 60 Operations per Hour

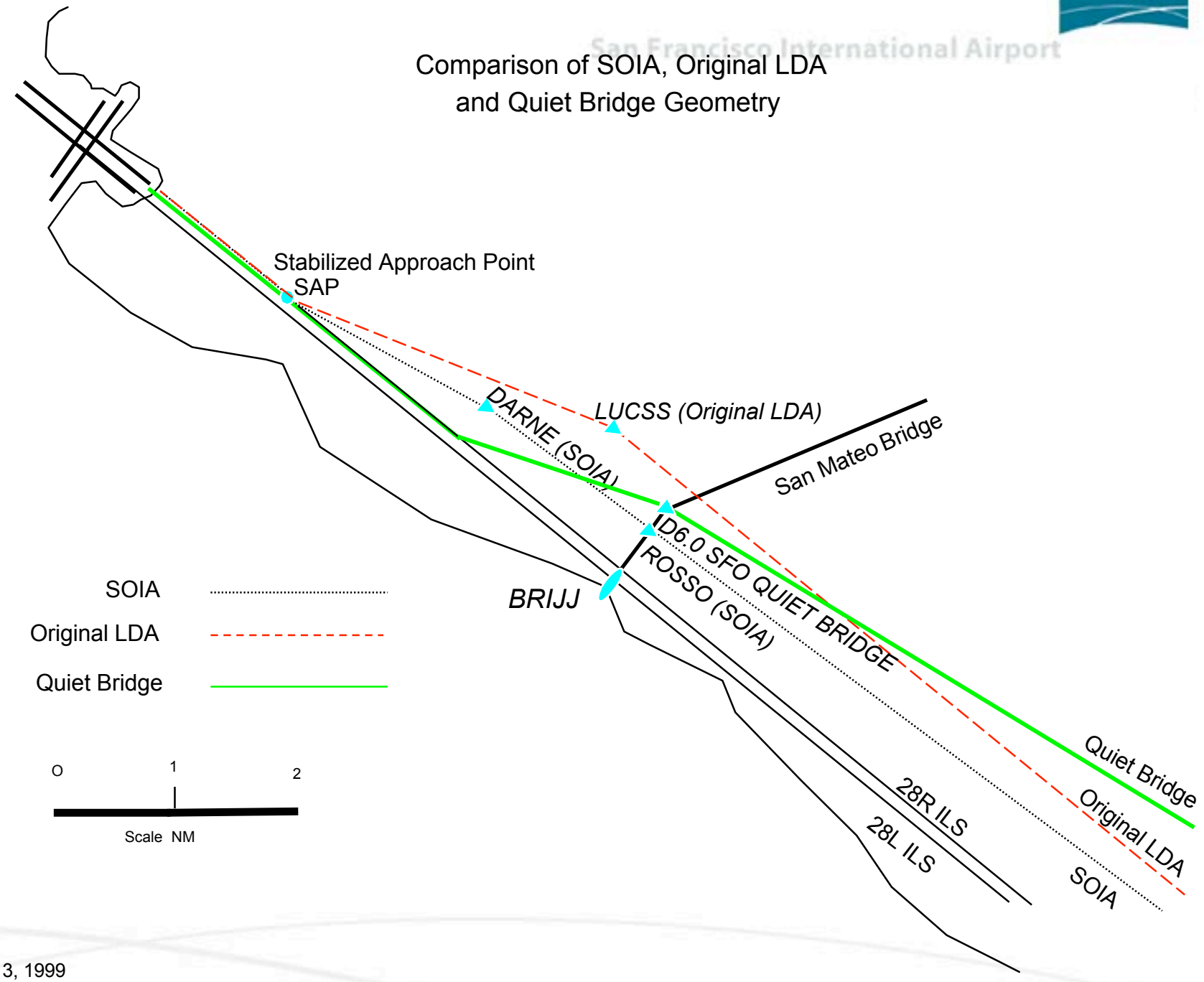


San Francisco International Airport

Runway 28R Instrument Landing System (ILS) During Poor Visibility and Low Ceilings Up to 30 Operations per Hour

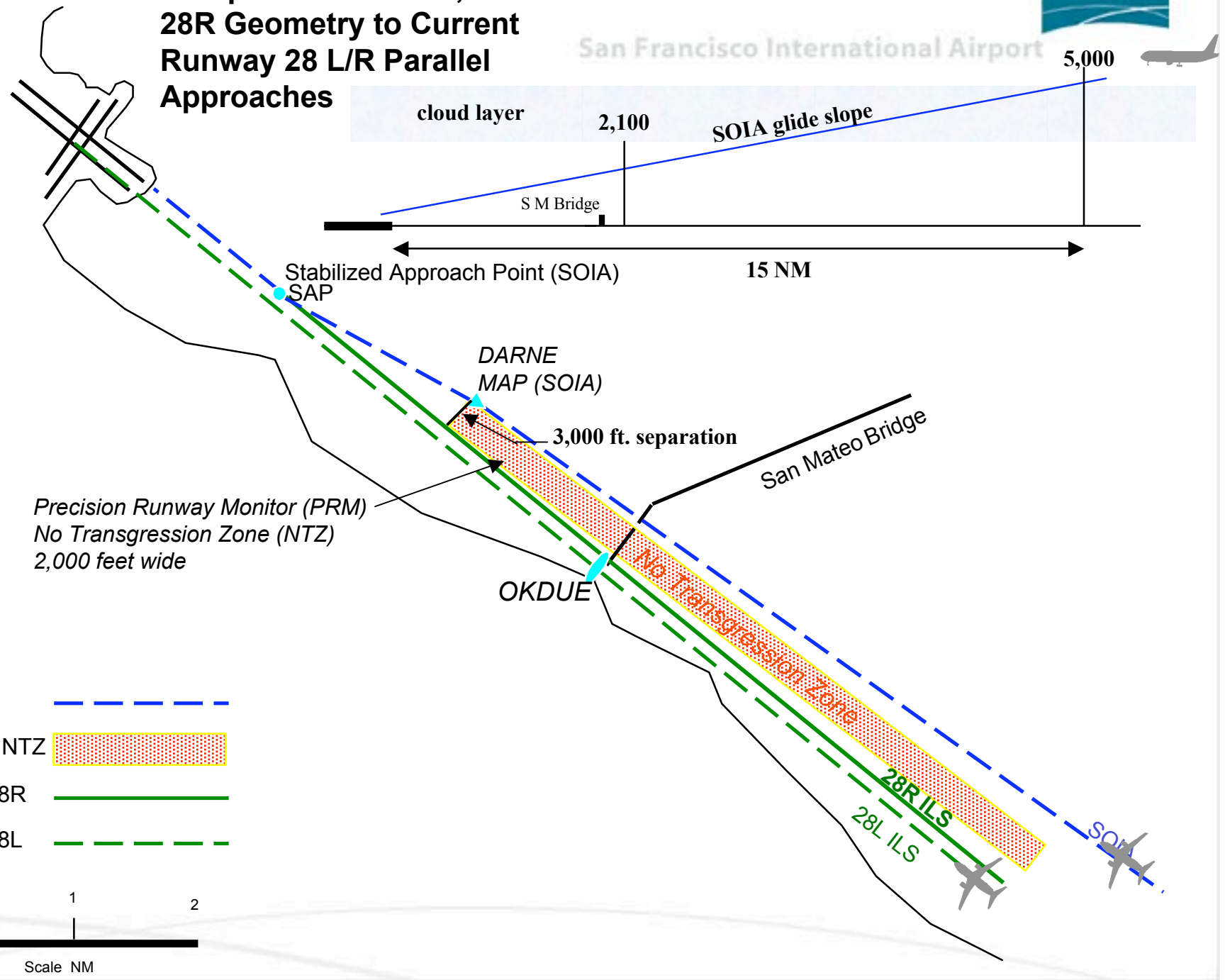


Comparison of SOIA, Original LDA and Quiet Bridge Geometry



December 3, 1999

Comparison of SOIA, ILS 28R Geometry to Current Runway 28 L/R Parallel Approaches



SOIA Overview:

- **Applicable when parallel runways are separated by 750’ - 3000’**
- **Uses a conventional Instrument Landing System (ILS) and a offset Localizer Directional Aid (LDA) with glideslope**
- **Uses a conventional Precision Radar Monitor (PRM) high update radar and monitor controller to ensure safe separation**

Advantages to the Airlines/Pilots

- **Precise repeatable vertical and horizontal approach guidance**
- **Minimum intercept angle to runway centerline**
- **Incorporates existing airplane technologies.**
- **No special simulator training**
- **No special aircraft certification required**
- **SFO capacity increase of 15-30% during SOIA operations**

Advantages to Air Traffic Control/Airport

- **Precise repeatable vertical and horizontal approach guidance**
  - **The airplane is predictable to the controller**
- **Incorporates existing PRM radar and ILS technologies.**
  - **Little additional controller training**
- **SFO capacity increase of 15-30% during SOIA operations**

Advantages to the Community

- **Increases capacity reducing weather related late night arrivals and departures**
- **Lowers the noise signature on the approach due to a continuous descent approach over a stepped down approach**

SFO SOIA Site Implementation Team represents an industry wide cooperative effort to increase capacity at SFO. Team Includes:

- SFO Airport
- Airlines (UAL is lead carrier)
- General Aviation
- FAA
- ALPA

The Future of PRM SOIA at SFO

To continue the capacity management and delay reduction originally intended we are working to refine what we have

- Need for the minimums to be lowered from 2,100’ to 1,600’
- Need to have the pilots comfortable with the safety of the approach
  - Separation
  - Wake turbulence
- Need to have the controllers comfortable with safety
  - Separation
  - Communication
- We will most likely require a communications waiver between the local Air Traffic Control Tower (SFO ATCT) and Northern California Terminal Radar Control Facility (TRACON)

Summary

- SOIA PRM is part of the FAA Office of Emergency Planning and FAA Reauthorization Bill
- SOIA PRM is a very simple procedure using existing technologies
- No additional training is required for most US carriers
- Some additional training is required for Air Traffic Controllers
- First SFO SOIA PRM flights were made on October 26, 2004

Summary

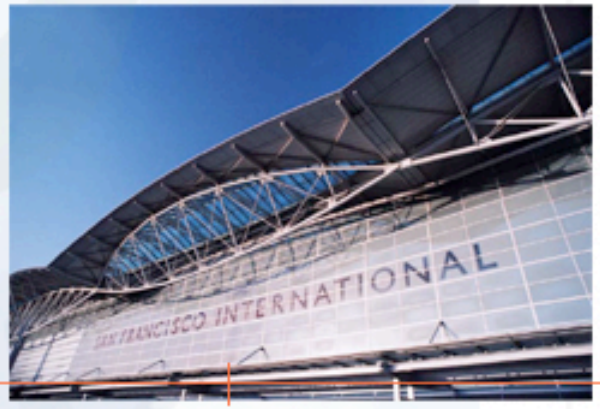
- United Airlines reduced flight delays in 2004 by six percent and believes that PRM/SOIA has had a direct result
- From the numbers available to date the controllers are getting better each time the procedure has been used.
- Arrival rates were originally estimated to be as high as 36 or 38 per hour but on several occasions we have noticed numbers over forty per hour
- Two revenue flights voluntarily flew the approach immediately following the inaugural press flights on October 26, 2004 showing the willingness of pilots to use the approach

Summary

- PRM/SOIA has been utilized on fifty separate occasions between October 26, 2004 and March 7, 2006
- While this approach was to alleviate our delays during summer stratus it has proved useful during some winter weather delay days
- We are working to make the approach more effective and safer through:
  - Minimums
  - Separation
  - Wake turbulence
  - Communications

SFO SOIA Operations 10/26/2004 through 3/7/2006

Date	Began	Ended	Duration	Arrivals	Rate	LDA PRM 28R	Sky Condition	Vis
10/26/04	11:31	12:04	0:33	22	40	9	BKN 42 to BKN 50	10
10/27/04	8:54	9:42	0:48	25	31	10	BKN 22	10
10/27/04	11:07	12:48	1:41	61	36	22	FEW 25 to SCT 40	10
11/08/04	9:32	11:26	1:54	65	34	32	BKN 30	10
11/08/04	11:57	12:46	0:49	25	30	11	OVC 31	10
11/08/04	14:38	15:28	0:50	26	31	4	OVC 30 to OVC 37	10
11/27/04	10:35	11:09	0:34	18	32	8	BKN 29 to BKN 32	10
12/07/04	9:33	9:59	0:26	21	48	11	BKN 21 to BKN 24	10
12/07/04	11:25	11:42	0:17	14	49	7	BKN 26	10
01/28/05	9:42	11:30	1:48	61	34	30	SCT028 BKN038 BKN055	9
01/28/05	14:13	15:12	0:59	32	33	11	SCT024 BKN037	10
02/07/05	11:07	11:38	0:31	21	41	10	FEW037 SCT046 BKN060	10
02/24/05	9:31	11:14	1:43	59	34	27	OIVC021	10
02/24/05	12:08	12:41	0:33	19	35	10	SCT019 OVC021	10
02/24/05	18:06	19:37	1:31	54	36	25	OVC021	10
02/25/05	10:18	10:38	0:20	12	36	7	SCT024 OVC029	10
02/25/05	11:11	12:31	1:20	51	38	24	OVC031	10
03/13/05	10:07	10:21	0:14	8	34	4	SCT023	10
03/22/05	9:40	11:44	2:03	68	33	38	SCT15 BKN22 OVC34	7
03/23/05	9:22	10:13	0:51	37	43	21	BKN025 OVC048	10
03/23/05	11:12	12:04	0:52	38	43	19	SCT025 SCT042 OVC055	10
04/07/05	10:06	10:34	0:28	20	43	9	FEW020 SCT035 OVC180	10
04/08/05	12:51	14:17	1:26	50	35	22	SCT031 BKN 065	8
04/11/05	9:42	10:28	0:46	31	40	16	BKN020 BKN038	10
04/11/05	11:34	12:08	0:34	26	46	11	SCT018 BKN028	10
04/24/05	11:15	11:50	0:35	27	46	15	SCT027 BKN035 BKN060	10
04/29/05	9:12	10:16	1:04	49	46	24	FEW015 BKN025	10
05/05/05	10:15	10:47	0:32	23	43	12	FEW012 SCT023 BKN065	10
05/05/05	14:21	14:56	0:34	17	29	8	SCT033 BKN055	10
05/06/05	11:12	11:33	0:21	16	44	8	SCT025 SCT055	10
05/06/05	18:45	20:00	1:15	39	31	18	SCT022 BKN033 BKN 090	10
05/06/05	20:52	21:34	0:42	31	44	16	FEW017 SCT038 BKN070	10
05/07/05	9:04	12:30	3:26	123	36	62	FEW017 SCT024 BKN041	10
05/09/05	9:36	10:36	0:59	44	44	21	SCT021 BKN033 BKN050	6
05/16/05	11:11	11:42	0:31	21	41	11	SCT022 SCT028	10
05/17/05	9:34	10:14	0:40	31	48	14	SCT024 BKN180	10
05/19/05	17:04	17:42	0:38	24	37	8	FEW012 SCT025 BKN040	10
05/28/05	10:23	10:49	0:26	16	37	8	FEW009 SCT014 BKN250	10
06/17/05	9:33	10:26	0:53	37	42	19	FEW028 BKN034 BKN041	10
06/18/05	9:30	10:23	0:53	31	35	16	SCT024 SCT034 BKN043	10
06/18/05	11:05	11:57	0:52	34	38	15	SCT024 SCT036 BKN 050	10
06/25/05	9:49	12:08	2:19	81	35	39	BKN024	10
06/27/05	10:34	11:25	0:51	35	41	18	BKN024	10
10/15/05	09:19	09:56	0:37	29	47	14	BKN018 OVC032	7
10/15/05	11:05	11:37	0:32	28	53	10	FEW015 SCT023	10
10/19/05	09:27	11:52	2:25	99	40	41	FEW015 OVC024	10
10/26/05	15:18	15:47	0:29	9	21	5	FEW012	10
12/12/05	17:08	17:58	0:50	33	48	16	BKN 32 to BKN 43	10
01/07/06	09:13	10:45	1:32	53	30	24	BKN 28	10
03/07/06	10:51	11:19	0:28	29	62	11	SCT060 SCT150	10



SFO

San Francisco International Airport

Thank You!